

WHAT IS CLAIMED IS:

- 1 1. A constitution of protecting a fuel delivery tube of an engine, comprising:
 - 2 1) an engine body including:
 - 3 a) a cylinder head, and
 - 4 b) a ladder cam bracket tightened onto the cylinder head, the ladder cam
5 bracket including:
 - 6 i) an outer frame,
 - 7 ii) an intake cam bracket integrated with the outer frame and holding
8 an intake cam shaft, and
 - 9 iii) an exhaust cam bracket integrated with the outer frame and
10 holding an exhaust cam shaft;
 - 11 2) the fuel delivery tube disposed beside the engine body and extending in a
12 direction substantially along a row of a cylinder; and
 - 13 3) an intake manifold made of a material free from a metal and including a
14 branch section which is disposed in such a manner as to oppose the engine body with
15 respect to the fuel delivery tube,
16 wherein the ladder cam bracket defines an outer wall on a side section thereof, and
17 the outer wall of the ladder cam bracket is formed with a protrusion which protrudes
18 toward the branch section of the intake manifold in such a manner as to prevent the branch
19 section of the intake manifold from causing an interference with the fuel delivery tube.
- 1 2. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 1, wherein
3 the ladder cam bracket is disposed in a vicinity of the fuel delivery tube.
- 1 3. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 1, wherein
3 the constitution includes a plurality of the protrusions.
- 1 4. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 3, wherein

3 the plurality of the protrusions include:

- 4 1) a first protrusion protruding from outside an end of the fuel delivery tube
5 extending in the direction substantially along the row of the cylinder, and
6 2) a second protrusion protruding in such a manner as to stride below the fuel
7 delivery tube.

1 5. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 3, wherein

3 at least one of the plurality of the protrusions is formed with a back face section
4 which causes a certain clearance to be defined between the back face section and an outer
5 wall on a side section of the cylinder head.

1 6. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 5, wherein

3 on the outer wall on the side section of the cylinder head, the back face section
4 substantially serially corresponds to a lifter bore side in the cylinder head.

1 7. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 5, wherein

3 the back face section is inclined in such a manner that a lower section thereof
4 becomes more spaced apart from the outer wall on the side section of the cylinder head.

1 8. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 5, wherein

3 the second protrusion is formed with a protruding back face rib as the back face
4 section, the back face rib being smaller in width than the second protrusion in the direction
5 substantially along the row of the cylinder.

1 9. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 8, wherein

3 the back face rib includes:

4 1) one back face rib formed substantially in a center substantially in a widthwise
5 direction of the protrusion, and

6 2) two back face ribs formed respectively at both two ends substantially in the
7 widthwise direction of the protrusion.

1 10. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 3, wherein

3 of the plurality of the protrusions, the protrusion that is disposed substantially in a
4 center in the direction substantially along the row of the cylinder is wider than the other
5 protrusions.

1 11. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 1, further comprising:

3 a rod member which connects a plurality of the branch sections of the intake
4 manifold in the direction substantially along the row of the cylinder, and faces protrusions.

1 12. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 1, further comprising an exhaust manifold,

3 wherein

4 in a direction of a vehicle, the intake manifold is disposed frontward while the
5 exhaust manifold is disposed rearward relative to the intake manifold.

1 13. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 1, further comprising an exhaust manifold,

3 wherein

4 in a direction of a vehicle, the exhaust manifold is disposed frontward while the
5 intake manifold is disposed rearward relative to the exhaust manifold.

1 14. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 1, wherein

3 the branch section is deformed in such a manner as to extend to an opposite side of
4 the engine body with respect to the fuel delivery tube 5, with an upstream side of the
5 branch section ending above the engine body.

1 15. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 14, wherein

3 a collector section disposed above the engine body extends in the direction
4 substantially along the row of the cylinder, with a first end of the collector section having
5 an inlet opening connected to a throttle body.

1 16. The constitution of protecting the fuel delivery tube of the engine as claimed in
2 claim 15, wherein

3 the throttle body connected to the intake manifold by way of the collector section is
4 disposed above the engine body.